

**METHOD FOR ITERATIVE AND NON-ITERATIVE DATA
DETECTION USING REDUCED-STATE SOFT-INPUT/SOFT-OUTPUT
ALGORITHMS FOR COMPLEXITY REDUCTION**

ABSTRACT OF THE DISCLOSURE

5 In a digital information processing system wherein a model of a finite state
machine (FSM) receiving a plurality of FSM inputs and producing a plurality of FSM outputs
is represented by a reduced-state trellis and wherein the FSM inputs are defined on a base
closed set of symbols, a novel method is presented for updating soft decision information on
the FSM inputs into higher confidence information whereby (1) the soft decision information
10 is inputted in a first index set, (2) a forward recursion is processed on the input soft decision
information based on the reduced-state trellis representation to produce forward state metrics,
(3) a backward recursion is processed on the input soft decision information based on the
reduced-state trellis representation to produce backward state metrics, wherein the backward
recursion is independent of the forward recursion and (4) the forward state metrics and the
15 backward state metrics are operated on to produce the higher confidence information.

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